Research Proposal/Synopsis

Studies on Effects of Insect Pests on Yield of Turmeric (*Curcuma Langa)* in Hingoli District M.S.,India.

Swami Ramanand Teerth Marathwada University,

Nanded 431 606

For the Registration of

Doctor of Philosophy in Zoology

By

Mr. Badrinath Ramji Galande

Under the guidance of

Dr. B.S. Salve

(M.Sc., B.Ed., Ph.D.)

Professor&Head , Department of Zoology,

Adarsh Education Society's

Arts Commerce & Science College Hingoli - Pin code 431513

Introduction (defination of problem)

The Indian saffron turmeric is called as *Curcuma longa L*(V.janani et.al.2021).

the member of zingiberaceae,. It is grown in the region of tropical and subtropical region.

Turmeric is popularly known as the Manjal in Tamil and also commonly known as Haldi or Hardi in Hindi. It is native to the South Asia around 100 varieties of turmeric are cultivated through the world, among these varieties around 40 varieties of turmeric are cultivated in India (Dr. J. Vijayakumar 2017).

Tamil Nadu, UttarPradesh, Bihar, Maharashtra, Karnataka, West Bengal, Andhra Pradesh and Kerala States have widely cultivated turmeric. (Dr. J. Vijayakumar 2017). In turmeric cultivation diseases are one of the most problems that reduce the yield & harvest quality of turmeric. The important disease that infects turmeric plants is rhizome rot disease, leaf spot disease, leaf blotch disease, dry rot disease, and bacterial wilt disease.The infection of such disease causes the change in the color and appearance of the turmeric leaves (Dr. J. Vijayakumar 2017).

Turmeric (*Curcuma longa. L*) is a perennial cylindrical, cross-pollinated rhizomatous herb belong to the family zingiberaceae. It has about 40 different genera and 400 species and the most common varieties are *Curcuma longa, Curcuma aromatic Curcuma amada* etc. (Sabbr Ahmmed2022.).

The crop is grown predominantly in Andhra Pradesh, Orissa, Tamilnadu, Assam, Maharashtra, and West Bengal. Turmeric is a native to South East Asia and is a herb with underground rhizome which constitute turmeric of commercial value (T.G Nageshwar Rao 1995).

Curcumin is the most biological active phytochemical compound is considered as the best in the world due to its high Curcumin content. India is the leading producer of turmeric with 78% of world production and the world's largest turmeric exporter (Prem Sudha 2017)

The turmeric disease has registered in a drastic reduction in rhizome yield (Prem Sudha 2017). Turmeric is long duration crop it is risky to wilt for the first disease symptom to initiate spray involving increased and unnecessary cost (Sudhir Navathe 2014)

Review of literature and development in the subject.

Many researchers worked on the disease of turmeric and pest effect on yield (V. Janani et.al 2021) review on diction of turmeric disease and mythology using an artificial neural network.

Sarodee Borah et.al (2015) evaluation of fungicides against leaf spot of turmeric caused by colletotrichum capacitor.

T.G Nageshwar Rao (1995) Disease of turmeric (*Curcuma longa L.*) And their management

Sabbir ahemad (2022) first report on rhizome rot disease of Curcuma longa caused by *Fusarium solani* in Bangladesh.

Dr.j. Vijayakumar (2017) study of turmeric plant disease and methods of disease identification using digital image processing technique.

Prem Sudha V (2017) feature a selection technique for the classification of leaf disease in turmeric.

Sudhir Navathe (2014) Epidemiology of leaf blight disease of turmeric caused by colletotrichiumgloeosporioides (Penz and Sacc).

Soheil Zorofchian Moghadamtousi et.al (2014) a review on the antibacterial antiviral and antifungal activity of curcumin

The Objective of Research/Proposed Hypothesis

1) Collection preservation and systematic position of turmeric pest

2) Ill effect of pest on crop

3) The study of soil parameters of turmeric crop

4) Estimation of crop damage by pest

Methodology to be adopted

For collecting different pestinsect it is necessary to use a wide variety of collecting and trapping methods however, nothing beats simply being in field and making observation with a keen eye basic collecting can be done by simply catching insects with your hands or net and putting them into some type of jar. But for more serious collecting additional equipment is needed. Collecting supplies some what depend on the group of an insect being searched for and the time of day they are collected. Supplies needed for day collecting can be quite different than those used for night collecting the same Idea applies to collecting terrestrial insects versus aquatic insects or flying insects versus soil-dwelling insects indeed it is difficult, not impossible to collect all types of insects by an individual on a single collecting outing.

It would also be impractical to carry many supplies for all collecting methods by a single person. Many collectors only collect those insects in a group they work with so they can handle the material collected in an efficient manner we collect a wide variety of insects using many different methods and traps.

I have given a list of many of the collecting supplies and traps used by Musium personal studies below.There is some overlap between supplies used for both day and night collecting. Following the collecting supplies list, a list of collection of insects is given.

Collecting supplies for terrestrial insect

1) Collecting bag or other container

2) Insec nets

3) Collecting jar (killing jar/alcohol vials)

4) Envelopes

5) Forceps

6) Beat sheet7) Aspirator

8) Sifter/pan (for leaf litter)

9) Bait

10) Hatchet ,knife,small garden Shovel or other tools

11) Permanent ink pen and label paper

12) Log book

13) GPS unit/maps

14) Camera(digital or film)

15) Sun screen

16) Repellant (Insect collecting method, by Joe mac gown https://mississippientomological musium.org . Msstate.edu/collecting preparation method.)

Importance of Study/Society Application

National Status

Around 100 varieties of turmeric are cultivated throughout the world. Among these varieties around 40 varieties of turmeric are cultivated in India.Tamilnadu, Uttar Pradesh, Bihar, Maharashtra, Karnataka, West Bengal, Andhra Pradesh and Kerala States have widely cultivated turmeric (Dr.J vijayakumar 2017).

International status

It is native to Southern Asia Indian turmeric is considered as the best in the words due to its high curcumin content.India is the leading producer of turmeric with 78% of world production and world's largest turmeric exporter.(Prem Sudha v 2017)

Significance of study.

Turmeric (*Curcuma longa* L) is one of the most important spice corp. Turmeric is high medicinal value. It great economically importance to farmer.

In medical field it is used as the antifungal wound, healing, skin disease, post operative in inflammation for the care of numerous diseases.

This research work is important for beneficial to the farmer society.

This work is conducted in the hingoli district because Hingoli District is second number district in Maharashtra for cultivation of turmeric. Turmeric used for the formation of the cosmetic ,dye, perfume ,ornamental plant and textile industries.
It will uplift the economic status of farmer. Study will helpful to the farmersto know different disease of turmeric crop and their control.

Proposed Work Plan/ Formulation and Structure of Study

Year-wise plan of work and target to achieve

First year

1) Literature survey

2) Periodical field visit

3) Collection, identification and preservation of pest

4) Study of soil parameters

Second year

1) Literature survey

2) Periodical field visit

3) Connection identification and preservation of pest

4) Study of soil parameter

Third year

1) Literature survey

2) Research paper publication

3) Thesis writing

References

1. Prem Sudha v, features election technique for the classification of leaf disease in turmeric, international journal of computer trends and technology (IJCTT) volume 43 number 3 January (2017) pp138-142
2. Sudhir navathe, epidemology of leaf blight disease of turmeric caused by colletotrichum gloeosporioides(penz.and sacc), scholarly journal of agriculture science vol 4(9),pp470-475, September 2014 available online at http://www scholarly journal.com/SJAS issN 2276-7118 (c) 2014 scholarly journal
3. Soheil zorofchian moghadamtousi et.al. hubsah Abdul Kadir, pouya hassandarvish,Hassan tajik, sazaly abubakar,kevivan zandi,A review on antibacterial, antiviral and antifungal activity of curcumin, hindwi publishing corporation biomed research international volume 2014 article ID 186864,12 page. http:/dx.doi.org/10/155/2014/186864
4. V.janani et.al.dr N.M siva mangai,R.naveenkumar, review on detection methods of turmeric disease and methodology using artificial neural network, international conference on smart data intelligence, (ICSMDI 2021)
5. T.G Nageshwar Rao, disease of turmeric (curcuma longa L) and there management journal of species and aromatic crops 4(1):49-56 (1995)
6. Sarodee borah et.al M .Borah,D barman,pranab dutta, evaluation of fungicides against leaf spot of turmeric caused by colletotrichum capcisi, international journal of plant protection volume 8/issue1/April 2015/55 -60
7. Dr.J. vijaykumar,study of turmeric plant disease and methods of disease identification using digital image processing techniques international journal on future revolution science and communication engineering, volume 3 ,issue
8. Md Sabbir ahammed et.al, first report on rhizome rot disease of curcuma longa caused by fusarium solani in Bangladesh. American journal of plant science (journalarticles.aspx? Journalist=207)>vol.13 No.4, April 2022 (home.aspx?issued=16543#116860)
9. Insect collecting method, by Joe mac gown https://mississippientomological musium.org . Msstate.edu/collecting preparation method.
10. S.S shende et.al R.D .Ahire and R .B.kalamkar study the profile of the turmeric grovers in hingoli district India international journal of current microbiology and applied sciences issN: 2319-7706 volume 9 number 11 (2020) journal home page http://www ijcmas.com

Mr. Badrinath Ramji Galande (Research scholar)

Dr.Balasaheb. S. Salve (Research guide)